



Wings of Fire Message Board: The SCIENCE! of Icewings

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The SCIENCE! of Icewings

dragondrawing333

Icewings we know them we love them, but how does their coolest (Pun totally intended) power work, their frostbreath. At first I thought the Icewings simply stored something like liquid nitrogen in some sort of sac inside their bodies, but this is just not very likely. Liquid nitrogen is the liquefied version of the gas nitrogen (Duh) it's a clear, colorless fluid with a boiling point of -320 degrees Fahrenheit. There's a reason you're supposed to wear safety equipment when handling liquid nitrogen. It's incredibly dangerous if misused. When two different temperatures meet they will try to balance out and bring the object to room temperature, and frostbite, put simply, occurs when the body temperature drops too low, and can be terrifyingly deadly, and painful. And while I do realize humans and dragons are just a *tad* bit different, which is true, mammals are endothermic meaning we generate and regulate our own internal body heat, reptiles, which we assume dragons are scales, forked tongue, etc., are ectothermic, meaning they have to rely on outside factors, to keep their body heat stable, and them alive. But, surprisingly, it actually seems that Phyrria's dragons are endothermic, seeing as none of the dragon tribes are stated as having to have heat or sunlight, the Rainwings do have an entire section of their day carved out for sun bathing, but that seems to be more for enjoyment rather than for actual survival. This raises some interesting questions as to what the residents of Phyrria would be scientifically categorized as, but that's a *whole* other can of worms, and not what I set out to answer. It did occur to me that maybe the Icewings are just straight up immune to the cold, it wouldn't be the biggest leap in logic, but no, in the abilities section for the Icewings it states, and I quote "Can withstand subzero temperatures." Notice it says that they are able to withstand, not that they're immune to extreme cold. I think that the Icewings are able to withstand subzero temperatures, thanks to thick layers of blubber underneath the scales, like a seal or polar bear, but the blubber wouldn't keep the Icewings alive if there is already a freezing substance already inside of them, thus it's not liquid nitrogen, or anything with similar properties. So... What is it? Well we know it can't be anything already freezing, refer to the arguments above, and beyond that, I was stumped, completely and utterly, until I came across an odd source of inspiration, the Bombardier Beetle.

This incredible bug from everywhere, is probably the closest thing Mother Nature will ever give us, to dragons. Ok, Ok, yes you would be completely justified in asking me if I've drunk any mercury lately, which I would answer yes to, but it's a fair comparison. When threatened this bug will turn around and squirt hot noxious chemicals at the aggressor, like some sort of nightmare skunk. It does this by mixing two chemicals inside its body, creating a biochemical reaction, from which heat is produced.

The Icewings aren't using some pre-existing source of cold, they're using their own biochemical biologics. Two sacs are located somewhere in the Icewings chest or neck, that are producing, storing, and pressurizing two reactive chemicals, when the ice dragon needs to defend itself, it calls forth the terrifying power of ice, the sacs force the chemicals into the mouth where they react, and shot out in a spray of death and ice, that immediately sucks the heat out of the afflicted object making it brittle, and if its living tissue, killing hundreds of cells and inducing deep frostbite and extreme hypothermia, killing the assailant within minuets.

I'm certain ill never look at Winter the same again, I'm also certain, Tui never intended this.



SCIENTIST!!!

(nickname)

There are equal amounts of bacteria in and on your body, as there are cells in your body, meaning that you are not just your cells, you are an amalgamate of creatures that form together to create you.

The SCIENCE! of Icewings

dragondrawing333

If you guys like this kind of thing, tell me what topic you would like me to apply my giant, pulsing, SCIENCE BRAIN!!!! to.

Here are some topics i am looking into.

Fire breathing- (I actually wanted to include this in this post but it didn't make it into the final cut, so here it is.)

Infact, the Icewings chemical frostbreath, is very likely just a specialized version of the other tribes fire breathing, which is also a chemical reaction.

Topics i could cover:

Mind reading

silk/firesilk shooting

Flying and Aerodynamics

Seawing phosphorescence

Rainwing camouflage



SCIENTIST!!!

(nickname)

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The SCIENCE! of Icewings

phoenixdragon1690

If IceWings had thick layers of blubber, though, it would be visible. It's my personal theory that they've got some kind of natural antifreeze in their blood.

This is awesome by the way



Such is the path of a dreamer: I find my way by moonlight.

~Oncilla~

Queen of Non Sequitur, Bookwyrms, Pangolins, and Bones

Trash Squad, Werewolf, GASTER FOLLOWER

Writer, roleplayer, nerd

WoFMBer Dec. 2014-Mar. 2019

The SCIENCE! of Icewings

dragonhawk3154

It's a cool theory!



𐐰𐐺𐐺𐐺性
Dragons

Night Forest

Howling ghosts they reappear, In mountains that are stacked with fear

Through pain, through fear, through darkness and death, I will always stay with you

The SCIENCE! of Icewings

dragonheart5600

This reminds me of the science video game theory did in fire Pokémon. Also, I would really enjoy hearing the science of mind reading, if you can manage that. If there's no studies or anything, ok.



🐾Cat/Sylvia🐾
Proud hufflepuff♥
pma!
beauty comes from unity🌈
where people taunt, hope says "try one more time"
#youbelongtoaduck
♥your loving hybrid friend,♥
catwolf76

The SCIENCE! of Icewings

dragondrawing333

I'm working on the mind reading thing, the problem is, that there is not that much SCIENCE!!! I can base the mind magic on, and there's no way to easily relate neural science to anything easily understandable. If you want it I'll write it, I'm just saying you might not like it very much.



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The SCIENCE! of Icewings

dragondrawing333

Pheonixdragon1690- That's such a good idea! It didn't even cross my mind.

Also, I'm so glad you guys like this! This is what I like to do and, apparently do it well.
Give me suggestions, it doesn't have to be from Wings of Fire.
Or post a rebuttal.

But I want to level with you, I'm not a scientist, I'm a nerd who like books and science, so take everything I say with a few grains of salt.

I'm also reeeeeeallly tierd.



SCIENTIST!!!

(nickname)

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The SCIENCE! of Icewings

dragondrawing333

I am posting many SCIENCE!!! theories, just click on my username and see where ive posted things, If its got SCIENCE!!! in the title, its mine.



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The SCIENCE! of Icewings

creativescarlet16

Where is that elusive star button. I must star you, but I can't find the button.



REMEMBER THE LOST

yEETS AWAY

"/thought mascara was a fish"-Galaxian

"Make an insect AU and they're all fruit flies"- Ishmael

"Brussels sprouts are just delicious earth meatballs"-Becky

The SCIENCE! of Icewings

azuredragon3714

Your name is now Austin.



~Quartz~

I changed my mind I'm staying

That one person who always gives you the opposite of help.

The SCIENCE! of Icewings

wolfdragon43782

Can you also explain IceWings' natural ability to emit a cold aura (and also explain the warm aura of the SandWings')?



~{Alphawolf/K-9}~

~The Forum Doggo

~Alpha of the OFWP

~Dino-nerd

~The Alpha Spartan

~CT-43782

#WeAreODST

"Thought I'd try shooting my way out. Mix things up a little." -John-117

I am a lone wolf.

The SCIENCE! of Icewings

dragonfeathers539

SILK!!!!!!!!!!!!!! do silk please!



The SCIENCE! of Icewings

dragondrawing333

Azuredragon3714- I didn't think anyone would get that reference.



SCIENTIST!!!

(nickname)

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The SCIENCE! of Icewings

dragondrawing333

Wolfdragon43782- I think its possible the Sandwings and Icewings are venting the excess Heat, or Cold respectively.



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The SCIENCE! of Icewings

dragondrawing333

MInd reading SCIENCE!!! is posted, finally!



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The SCIENCE! of Icewings

vanilladragon282

This is amazing and nerdy and I love it.



~+Rexy+~

Queen of all things Jurassic Park and anime related
Status: Semi-Active

#RememberHurricane

#LGBTQ+

[LunaStar](#), [Gulfstream](#), [Violet](#) ~Forum Sis

OC's:

Aquila/Zeus

Crocodile

Python

Cactus

Kuchikori

Borealis

Prismatic

Souleater

Myscelia Ethusa

Mendica

Hornet

The SCIENCE! of Icewings

dragondrawing333

Dragonfeathers539- I can do that, unfortunately not right now, I'm actually out of town and didn't bring my copy of The Lost Continent, just Moon Rising.



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The SCIENCE! of Icewings

wolfdragon43782

@Rexy I like the nickname. I'm also a fan of Jurassic Park, if you check all my dinosaur posts...



~{Alphawolf/K-9}~

~The Forum Doggo
~ Alpha of the OFWP
~ Dino-nerd
~ The Alpha Spartan
~ CT-43782

#WeAreODST

"Thought I'd try shooting my way out. Mix things up a little." -John-117

I am a lone wolf.

The SCIENCE! of Icewings

dragondrawing333

Rexy- Im so glad you like it.

Ive posted two other SCIENCE!!! (Post? Letter?) Things, but they haven't appeared in my "My Posts" what in the world is happening?



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The SCIENCE! of Icewings

dragondrawing333

The Science!!! Of Rainwings

Rainwing camouflage. Need i say more? Yes? The dragons from the Rainwing tribe are able to change the colors of their scales in such a way that they can become invisible. Awesome. But how does it work? Complicatedly.

When i think color changing or camouflage, i think of the Chameleon. The chameleons skin has a superficial layer which contains pigments, and under that layer are cells filled with *Guanine crystals*, chameleons change color by increasing or decreasing the space between the crystals, which changes the wavelength of light reflected off the crystals, which changes the color of the skin. Different species of chameleons are able to vary their coloration and pattern through combinations of pink, blue, red, orange, green, black, brown, light blue, yellow, turquoise, and purple. All colors Glory and other Rainwings shift through, throughout the series.

While the chameleon, which i want to mention, Rainwings are totally based off of (am i the only one who didn't immediately realize this?) is obviously not camouflaged enough to be effectively invisible like the Rainwings, so how are they dissapearing? I have a theory. I beleive the Rainwing's scales are acting like the pixels on a Tv. If you've ever watched something on an old Tv, you probably noticed the quality of the video was not nearly as defined as neweer models of the same Tv. This is because newer technologies have more pixels compared to older ones, pixels are the tiny colored dots you see if you get really close to the screen, each holds only one color at a time, so the more pixels it has, the higher definition image you'll recieve.

So, the Rainwings are able to go completely invisible thanks to the billions and billions of cells filled with Guanine crystals, (The pixels if we're going with my Tv screen analogy.) many hundreds of times more than the chameleon.



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The SCIENCE! of Icewings

dragonheart5600

That's actually really interesting and makes a lot of sense. Thanks for enlightening us. :)



🐾Cat/Sylvia🐾
Proud hufflepuff♥
pma!
beauty comes from unity🌈
where people taunt, hope says "try one more time"
#youbelongtoaduck
♥your loving hybrid friend,♥
catwolf76

dragondrawing333

I'm so confused, My Nightwing mindreading post keeps disappearing. What is going on? If the site keeps taking it down does that mean its right?
Theory confirmed.



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wolfdragon43782

@Wings of Fire Scientist/Theorist *illuminati theme plays*



~{Alphawolf/K-9}~

~The Forum Doggo
~ Alpha of the OFWP
~ Dino-nerd
~ The Alpha Spartan
~ CT-43782

#WeAreODST

"Thought I'd try shooting my way out. Mix things up a little." -John-117

I am a lone wolf.

dragondrawing333

The Science!!! Of Silkwing Silk

I hate spiders. They give me the Heebie- Geebies, so imagine my displeasure, when every single website i used for reference, were permeated with pictures of monsturous, hair, multi-eyed, tarantulas... AAAAAAHHHHHHGGGGG!!!!

One of the new species of dragon, the Silkwing, is awesome and that's un-debateable, but the way their coolest, and rarest, power works, is. Flamesilk. Flamesilk, is a very rare, genetic, variation of the usual power, which is to shoot sticky webs, which they use to build structures (The entire tribe must have been bitten by radioactive spiders.) The Silkwings take inspiration from many different bugs and arachnids from the animal kingdom such as: Butterflies, Moths, Spiders, Dragonflies, and even Beetles, thus i have many different areas of biology to look through. Contrary to popular belief, its not just spiders that produce silk, several larval forms of other bugs, such as the Silk moth, use silk to make their cocoons, which is incidentally (Not really) exactly how Silkwing dragonets metamorphise into their adult forms. But thankfully, it doesn't really matter all that much, they all use *Spinnerets*.

A Spinneret, is a silk-spinning organ, found in the underside of a spiders abdomen. Most, but not all, spinnerets are far more complex than a single spinner, with a single thread, but instead are incredibly complex structures with many, microscopic spinners, each producing one thread, in part because it creates the necessary positioning of protein molecules, without which, the silk would be weak and useless. This process also allows for different types of string, for different uses (Just like the Silkwings... *DID* Tui think this through?)

Okay, on to the Flamesilk. Just like with many of the Biological feats of these dragons, the answer lies in Biochemical reactions. Located within the Flame- Silkwing's spinnerets are chemicals that when mixed will react and produce heat, heat that transfers to the silk creating, Flamesilk. Okay, that's one of two parts of the Flamesilk answered, the other, unfortunately, I couldn't answer. the Hivewing queen in the book is revealed to be (Spoilers!) Harvesting Flame-Silkwings's silk, and using it to light lanterns all over the kingdom, for months at a time... WHAT? How is this possible? Saving you the hassle, its not. Fire requires three things to stay lit, called the *Fire Triangle*, Oxygen, Heat, and Fuel, if you remove one of these components, the triangle collapses. If the Flamesilk is being put in the lantern by itself, it will quickly lose heat, because there is no fuel to, well, fuel it, thus no fire to keep the lanterns lit.

-Special thanks to Dragonfeathers539 for suggesting this topic-



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The SCIENCE! of Icewings

wolfdragon43782

@Wings of Fire Scientist/Theorist I like it, but try to address other forumers by their nicknames in their signature(we call it siggy for short). Like, mine is Alphawolf, if you look down.

~{Alphawolf/K-9}~

~The Forum Doggo
~ Alpha of the OFWP
~ Dino-nerd
~ The Alpha Spartan
~ CT-43782

#WeAreODST

"Thought I'd try shooting my way out. Mix things up a little." -John-117

I am a lone wolf.

The SCIENCE! of Icewings

dragondrawing333

If that's what you,d prefer.
Can you give me a topic? I'm kinda floundering, trying to find interesting ideas.

SCIENTIST!!! (nickname)

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The SCIENCE! of Icewings

dragondrawing333

The SCIENCE!!! Of Seawing Phosphoresce

The Seawings of Tui T. Sutherland's Wings of Fire book series, have patches, stripes, and spirals that light up on command, and can be used for communication, and to illuminate dark areas. But how do they do it? They can't breathe fire unlike many of the other species, so it's not generated by internal heat or flame, so is it

electrical? Not likely, the exact reasons are a little too complicated for me to explain efficiently, so trust me when I say it's just not possible.

So, in the absence of my knowledge, (I know it's really hard to believe, but I don't know everything, just almost everything) I turned to the animal kingdom, for real life examples of the Seawing. Meet Etmopterus perryi, more commonly known as the Dwarf Lantern shark, a deep sea fish found between 283-483 meters under the water in South American seas. This stupidly small shark, is able to light up the underside of its fins and its underbelly, like a living glowstick. It does this by activating its Photophores, a photophore is an organ mostly found in marine animal's skin that appears luminous, and these incredible organs can be super simple or as complex as the human eye, complete with shutters, filters, and reflectors. Photophores use bioluminescence, bioluminescence is the production and emission of light by a living creature. In some animals, the light is bacteriogenic, produced by symbiotic bacteria such as the Vibrio Bacterium, in others it is autogenic, produced by the animal itself.

The main chemical reaction in bioluminescence involves some light emitting molecules and an enzyme, generally called the Lucifrin and the Luciferase. Because these terms are used very broadly, the chemicals are distinguished by including the species name I.E. Seawing Lucifrin.

So, in conclusion, the Seawings could really be using any of these methods, and at the present time, I don't have enough information to give you a definite answer, so pick whatever one you like most.



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(nickname)

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The SCIENCE! of Icewings

dragondrawing333

The Science!!! Of Icewings- Footnote

So thanks to a really Cool rebuttal by Oncilla, which said "It's my personal opinion that the Icewings have some sort of natural antifreeze in their blood." (Which was very clever), I did some research into antifreeze in the animal kingdom, and I came across this little guy, the Wood Frog. The Wood Frog, during the winter months, will bury itself in the ground, and release Urea into its blood, acting as a natural antifreeze. Frostbite occurs when microscopic ice crystals grow in the flesh and destroy cells, the Urea keeps the crystals from forming. Though it's worth mentioning that the frog hibernates during this period, so I have no idea how the Urea-antifreeze tactic would work with fully active animals.



SCIENTIST!!!

(nickname)

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The SCIENCE! of Icewings

dragondrawing333

The Science!!! Of Sandwing Thermal Regulation

So, Sandwings. There's so much I could cover with this dragon species, the venom in their tail, the water storage, but I have to do just one at a time. Sigh.

This question was brought up to me already, and I gave kind of a dismissive, basic scientific answer. But the more I thought about it the more I realized how little I actually explained. The question was: "Why do the Sandwings and Icewings have their natural aura of cold or hot, respectively."

My knee jerk response, is to say that, it's just what their internal body temperature stays at, due to the climates they live in. It could be, but that's not fun, so I'm going to keep theorizing. It could be that their bodies are releasing that temperature, to tell possible mates, that the individual is healthy and would be a good partner. But this wouldn't show up in their natural climates, so it's not likely.

What's far more likely, is that the aura is just the bi-product of the actual biological awesomeness, Thermal regulation. Thermal regulation is the process by which an Endothermic animal, keeps their internal body heat stable. So let's use the Sandwing as the example here, because I've already done a Theory about Icewings. So the Sandwing, whilst in the desert, starts to heat up, and since reptiles don't sweat, has nowhere to go, so the Sandwings body starts venting the heat out through gaps in the scales, creating an "Aura" of heat. Humans actually do something similar, it's called sweating.

Sweating, or more accurately evaporative cooling, is actually a super complex process, compared to what you might think. So when your body starts to heat up, whether do to temperature, or physical labor, will start to release sweat from your pores. The sweat is slightly cooler than your flesh, so do to the nature of heat, which is that heat will try to transfer between two objects and make them both room temperature, the heat on your skin will rush into the sweat, and evaporate it, carrying away the heat.

-Special thanks to Wolfdragon43782 for suggesting this topic-



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The SCIENCE! of Icewings

bluedolphin8423

About the SandWing theory—what about when SandWings are in colder environments? There are various occasions when SandWings are outside of the desert's extreme heat, but they still radiate warmth from their scales.

Also, maybe flamesilk isn't actually fire. Maybe it's instead a chemically infused type of silk that is bioluminescent. (how it would generate heat on its own, I'm not sure. I'm not a scientist :P)

I really like your theories!



bluedolphin8423

CHRISTIAN!✝

^ These two have been and will be up here till the day we're gone.

LUPA ★ 2647

February or July 2015 – March 2019

the forum nostalgia pile

remember the lost. *that's* what matters.

ClerilisaFRUIT

Toasteril

balegu

The SCIENCE! of Icewings

twilightstone73

OMG, HOW OLD ARE YOU,
SIGINTIST?



(- * P. A. S. T. E. L. * -)

She/Her

OCs:

Pastel,

Twilight,
and Indigo (NEW!)
BFF: Zoe ^-^
Where are my, Pastels?
A loyal.. RainWiNg!
Pawat, you stole my, HeArT
When your, LiGhT won't turn on..
Faceplams #
Fortnite4Ever

The SCIENCE! of Icewings

yellowunicorn154

This was cool.



Yellow

Zebrasarecool

#SunnyLickedAQibli
#ClerilIsAFruit

DemonxYellow

"Unless someone like you cares a whole awful lot, nothing is going to get better. It's not." ~The Lorax

Christian!

"LICK LICK LICK" she said as she was put in an assylum

The SCIENCE! of Icewings

dragondrawing333

14.



SCIENTIST!!! (nickname)

There are equal amounts of bacteria in and on your body, as there are cells in your body, meaning that you are not just your cells, you are an amalgamate of creatures that form together to create you.

The SCIENCE! of Icewings

dragondrawing333

Thank you Lupa, I didn't at the time of writing that post, have access to all my wings of fire books, just Moon Rising. While your right, it could be chemically, and bioluminescently infused, that doesn't explain the longevity of its glow, due to the *law of Conservation of Energy*, energy can neither be created or destroyed, just changed from one form to another. The energy required for chemical reactions or bioluminescence, has to be coming from somewhere. And as far as we know, the string has no source of energy.



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The SCIENCE! of Icewings

dragondrawing333

Also, I love it when you guys post a rebuttle, a critique, or a request, because if you don't, i have no idea if i'm writing good content, what i could do better, or if my science is right. I need you guys to keep me in check.



SCIENTIST!!! (nickname)

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The SCIENCE! of Icewings

dragondrawing333

The Science!!! Of Mudwing Fire- Resistance

(Spoilers!)

'For wings of earth, search through the mud, for an egg the color of dragon blood'

Mudwings, the hulking, familial dragons in the Wings of Fire series, are able to do some pretty cool things, such as: Holding their breath for up to an hour, breathing fire, and blending in with the swamp, and for the semi-rare dragons born of blood red eggs, Fire resistance.

Actually, Fire resistance probably isn't the right term, since we see this ability used for many things exceeding just plain old fire. In *The Dark Secret*, we see the resistance pushed to the limit, when Clay the Mudwing, Blocks a flow of LAVA, and walks away completely unharmed. So, it's more accurate to say that Mudwings hatched from blood red eggs are *Heat* resistant.

And just so you have some context, I'm going to explain burns degrees one through four. Burns are caused by many different things, such as, boiling liquids, chemicals, electricity, fire, and even excessive sun exposure, but as we covered above, the resistance is only ever used for heat, so the other causes are negligible, at least until Clay gets struck by lightning.

First degree burns are also referred to as superficial burns, because the damage doesn't go deeper than the first layer of skin. And while the burn is still painful, it won't scar, and is usually healed within seven to ten days. Second degree burns, extend beneath the first layer of skin, and thus Blister (Blaze and Burn). Some sever cases of second degree burns can take upwards of three weeks to heal, and don't scar, but do change the color of the affected skin. Third degree burns extend through every layer of skin, and without surgery, can leave extensive scarring. There is a misconception about third degree burns that they're the most painful type, but, the nerve damage that comes with this degree of burn-age would actually be so terrible that you might not even feel it. Forth degree burns are the same as third degree, except extended into muscle and bone.

So, how is Clay withstanding the temperatures generated by something like lava? I... don't know, and I HATE not being able to give you guys a definitive answer for these questions, but unless you want me to lie about the data, and the Science!!! (It hurts me to even think of this) then you'll just have to deal with it. But I can disprove the explanation given by the book.

In *The Dragonet Prophecy*, whilst in Peril's cave, Starflight and Tsunami speculate as to how Clay's newfound ability works. They basically say that, (I'm not writing in the excerpt because, well, I'm lazy) once Clay came in contact with mud for the first time, his "Fire" resistance ability really started to develop, and that he isn't immune to heat, he's just healing from these burns really quickly.

The problem with this explanation, is that Clay's super healing *ONLY* works on burns. This is not how healing works, your healing system isn't just picking and choosing which injuries are worth fixing. If his heat resistance works as it would in real life, the big sacrifice Clay makes in the final pages of *The Brightest Night*, where he throws himself in front of Starflight, and is bitten by a super deadly snake, wouldn't be that big of a sacrifice, his healing powers would isolate and destroy the venom, and close the fang marks. Instead, Peril has to step in and carve out his venom filled flesh, saving Clay's life, but also leaving him with a permanent handicap, unable to run or walk effectively.